Site Prep Gone Bad

9 Month Old Planted

If the timber consideration is not available from the buyer/seller or the appraiser desires to confirm the information that was provided in the consultation, the timber value may be calculated using the valuation methods defined in Rule 560-11-10-.09(3)(b)2(v)(I)I. As prescribed in the aforementioned Rule, the appraiser should calculate the value of all product classes of merchantable timber (trees 15 years and older) and the value of all pre-merchantable timber and sum both values to obtain the total timber value.

In order to calculate the value of merchantable and pre-merchantable timber, the appraiser will be required to gather data with regard to the volume of the timber product classes and the pricing that corresponds to the time of the sale. Volume information may come from the buyer/seller or a party trained in the gathering of such information. Pricing information can come from the local market or from the Table of Owner Harvest Timber Value as prepared by the Revenue Commissioner on an annual basis. The Table of Owner Harvest Timber Values from the year that precedes the sale should be used. The appraiser should ensure that local pricing information is as close as possible to the date of the sale due to the fluctuation in timber prices.

When working with the pre-merchantable timber valuation forms in addition to volumes, the appraiser must also gather information regarding the age of the pre-merchantable timber stand and stocking density. A "timber stand" can be defined as a group of trees exhibiting basically the same characteristics with regard to the manner of planting, species and age.

The age of the stand can be obtained from the buyer, seller or forester. In the absence of information from other sources, the appraiser may estimate the age of the stand by dividing the height of the trees by 2 if the stand is natural regeneration or 3 if the trees are planted.

201

Below is an example of natural reproduction where nature is taking its course with regard to the establishment of the timber stand. The trees have no pattern regarding the manner in which they are planted.

06/28/2006

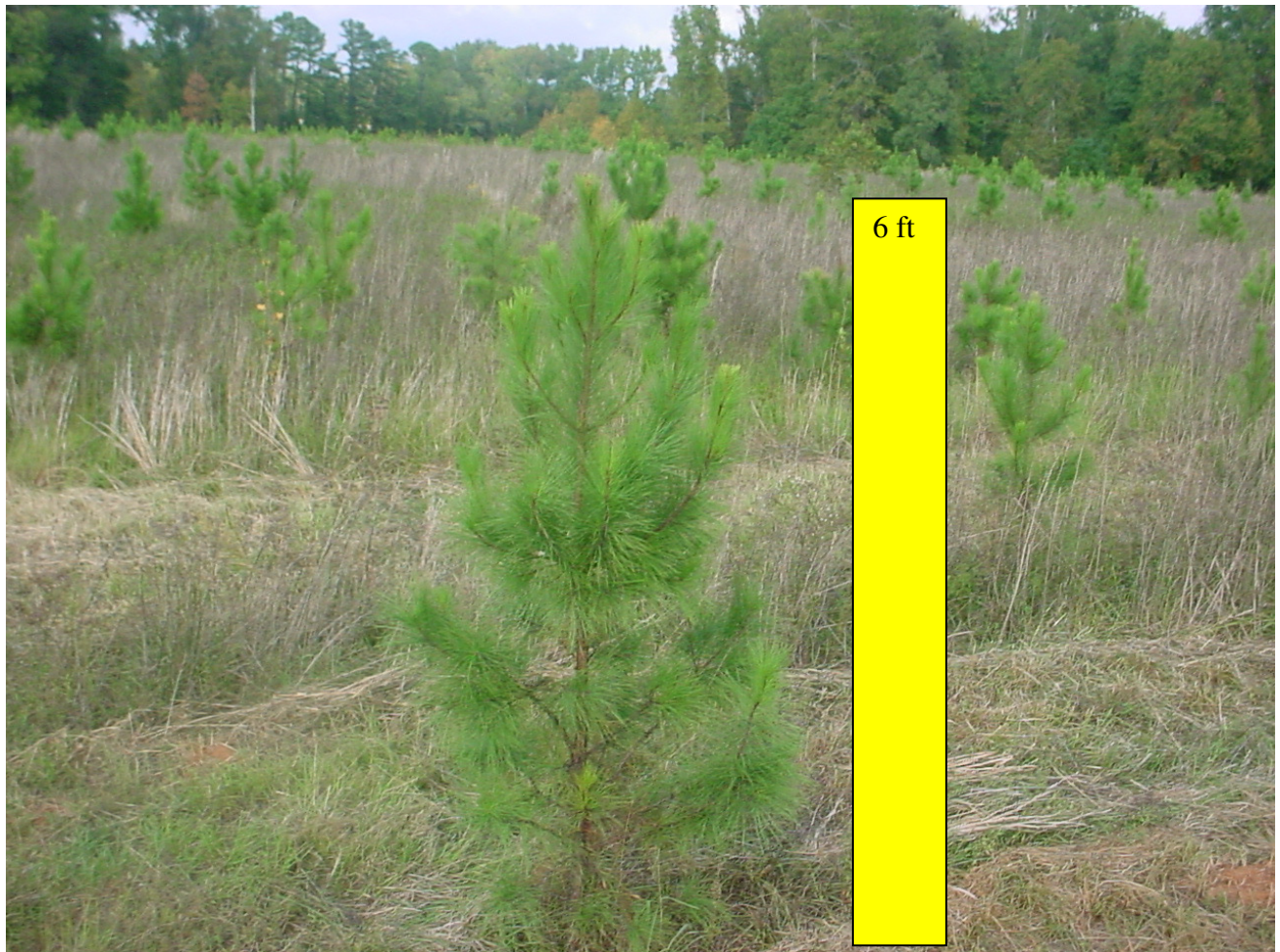The following photos provide examples of planted pine stands.

Timber Regulations

Estimate the age of the above planted pine stand based on the photo below.

Following is an example of planted pines which are about 7 to 8 years old.

Aerial photo of stand above

In addition to the age of the pre-merchantable stand, the appraiser must also gather information as to the stocking density of the trees. Stocking density relates to the pattern in which the trees are planted and the percentage of trees that have survived. The standard stocking or planting pattern varies depending on the tree species and the preferences of the forester or landowner. Typical patterns are 10' x 6' which is 10 feet between rows and 6 feet between trees in the row. This provides 726 trees per acre (43,560 / 60 = 726). Another partten that is used with the newer faster growing trees is 12' x 6' which puts 605 trees per acre in the ground. Some foresters prefer a 10' x 8' planting pattern with 545 trees per acre. Stocking density is basically the survival rate of the trees and can be determined by dividing the number of living trees by the number of trees that would be present based on the planting pattern within an area. The planting pattern and stocking density will best be determined from an onsite visit and observations from aerial photos.

For example, if a planting pattern of 10' x 6' was found in a stand of trees and it was determined that on the average 30 trees per acre had died, the stocking density could be calculated in the following manner:

1. Square ft per tree = 10 x 6 = 60
2. Trees per acre = 43,560 ÷ 60 = 726
3. Trees present = 726 – 30 = 696
4. Stocking Density = 696 ÷ 726 = .96 (or 95% stocking density

The planted pines below would represent a 100% stocking density.

The photo below represents something less than 100% stocking density (approximately 80%) due to the high mortality rate of the planted pines. Notice the missing pines in the planting pattern.

The stocking density for natural regernation is 50% for pine stands and 40% for hardwood. These densities are specified in the APM. (560-11-10-.09-(3)- (b)-2-(v)-(I)-III-B)

Stocking Density Exercise

Determine the stocking density of a stand with a planting pattern of 12' x 6' where on the average 15 trees per acre are missing.

207

After the volume, age, stocking density and pricing information are obtained, the appraiser may use forms similar to the ones on the following pages to calculate the timber value for the sale. Computer generated forms that simulate the calculations in the forms below should be created when possible. The computer forms, once the formula and procedures have been validated, increase the efficiency and reduce the potential for calculation errors.

In addition to valuing pre-merchantable timber for value extraction, a value will need to be determined for stands of trees that have reached the age of merchantability (older than 15 years). There are no "magic formulae" or definitive steps such as with pre-merchantable timber in determing the value of merchantable timber. The knowledge and expertise of an individival trained in collecting timber information should be utilized when merchantable timber is present. A cruise which is defined as an estimation of the volume and value of timber is a preferred means of obtaining the value of merchantable timber.

Merchantable timber can be assigned to one of the 3 major categories, pulpwood, chip-n-saw and sawtimber. Many natural stands will have a mix of all 3 categories. Planted stands of timber due to the fact that the trees were planted at the same time will be of one category but over time will evolve into the next higher merchantable category.

1. Pulpwood – Trees between 4 to 8 inches dbh (Diameter Breast Height – 4.5 ft above forest floor on uphill side of tree)

2. Chip and Saw – Trees between 9 to 12 inches dbh

3. Sawtimber – Tree with dbh above 12 inches

In addition to the 3 major categories above, merchantable timber may also fall into one of the categories listed below:

1. Poles

2. Posts

3. Fuel Chips

4. Firewood

Timber Calculation Worksheets

The following pages contain worksheets that may assist the appraiser in determining the value of timber to be extracted from the sales price. The worksheets are designed to follow the directions provided in the APM for the process of timber extraction.

Worksheets are provided for each category of timber and a summary of the timber value. The following worksheet examples are provided:

1. Merchantible Timber – The worksheet contains rows with the timber product classes listed in the Table of Owner Harvest Timber Values and columns for volumes, prices and value calculations.

2. Premerchantible Planted Pine – The worksheet would be used on stands of planted pine whose age is less than the age of merchantability. The worksheet follows the steps outlined in the APM for the value calculation of this timber type

3. Premerchantible Pine (Natural) – The worksheet is the same as the Premerchantible Planted pine with the exception of the stocking density of 50% being inserted and the cost of establishing the stand being removed per the APM.

4. Premerchantible Hardwood (Natural) – The worksheet is the same as the natural planted pine sheet with the exception of the stocking density being set at the prescribed 40% level.

5. Timber Value Summary – The value of all timber present on the parcel can be summarized using this worksheet.

6. Productivity Volume – This worksheet would be used when the appraiser determines that the best means to obtain the volume of the premerchantible timber is by the Conservation Use Productivity method in the APM.

Timber Valuation Worksheet - Merchantabile Timber				
Map ID:		Date:		
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Volume (Tons)**	**Unit Price**	**Value**	
Softwood Pulpwood				
Softwood Chip-n-Saw				
Softwood Sawtimber				
Softwood Poles				
Softwood Posts				
Softwood Fuelchips				
Hardwood Pulpwood				
Hardwood Sawtimber				
Hardwood Firewood				
Total Merchantable Timber Value				
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood				
Chip-n-Saw				
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Total Value (Total Value/Acre x Acres)				
Cost (Cost of Establishing Stand / Acre * Acres)				
Base Value (Total Value – Cost)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				
Total Accumulated Value (Accumulated Timber Growth + Cost)				
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Natural)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood			.50	
Chip-n-Saw			.50	
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Base Value (Total Value/Acre x Acres)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Value of Accumulated Growth (Avg Annual Timber Growth * Age of Stand)				
Information Supplied by:				

Timber Valuation Worksheet - Hardwood Pre-Merchantable (Natural)					
Map ID:			Date:		
Buyer/Seller Value:					
Estimated Value Calculations					
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**		**Value**
Pulpwood			.40		
Chip-n-Saw			.40		
Total Value/Acre (Pulpwood + Chip-n-Saw)					
Acres of Pre-Merch					
Base Value (Total Value/Acre x Acres)					
Age of Merch (15 is default; local conditions take precedance)					
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)					
Age of Stand (in years)					
Value of Accumulated Growth (Avg Annual Growth * Age of Stand)					
Information Supplied by:					

Timber Value Summary	
Map ID:	Date:
Timber Type	**Value**
Merchantable	
Pine Pre-Merchantable (Planted)	
Pine Pre-Merchantable (Natural)	
Hardwood Pre-Merchantable	
Total Value of all Timber Types	

The following worksheet can be used as a guide to generate the volume of pre-merchantable timber stands that are being valued with productivity ratings and the Productivity – Timber Yield charts found in Rule 560-11-10-.09(3)(b)2(v)(I)II. A separate worksheet should be compiled for the various timber types and age of stand categories that are present on a parcel. The volume entries for pulpwood and chip-n-saw are found in the Productivity-Timber Yield charts.

The % of Stand Ac column is calculated based on the acres within the productivity rating divided by the total acres with the timber type-age stand. For example, if a planted pine stand contained 20 acres of 6 year old Slash pine with 5 acres in a Productivity Class of 2, the % of Stand Acreage calculation would be $5 \div 20 = .25$ or 25%.

The Wt PW Vol (weighted pulpwood volume) and the Wt CS Vol (weighted chip-n-saw volume) columns will contain the weighted volumes for pulpwood and chip-n-saw within the productivity rating. Using the 25% of Stand Acreage within Productivity Class 2 for the Slash pine, if the pulpwood tons/acre is 90 tons and the chip-n-saw tons/acre is 10, the weighted volume values would be calculated as follows:

$$Wt\ PW\ Vol = 90 * .25 = 22.50 \qquad\qquad Wt\ CS\ Vol = 10 * .25 = 2.50$$

The summation of the weighted volume columns would be placed in Total Volume. The Total Volume is then used in the pre-merchantable timber calculation.

Productivity-Volume Worksheet					
Map ID:			Acres:	Date:	
	Volume – Tons/Acre				
Productivity	Pulpwood	Chip-n-Saw	% of Stand Ac	Wt PW Vol	Wt CS Vol
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

When using the Conservation Use Productivity ratings, additional information regarding which of the 3 major geographical regions the county is located within and the type of pine trees planted is required in order to correctly value the pre-merchantable timber. A county along the division line of two of the geographical regions may have some sales located in one regions and other sales located in the second region.

For the purpose of timber value extraction, the State is divided into 3 primary geographical regions:

1. Piedmont – basically the portion of the State above the Fall Line

2. Upper Coastal Plain – bounded on the north by the Fall Line and extends south to Florida and east to the lowest terrace that borders the Atlantic Ocean and the coastal islands and salt marshes

3. Lower Coastal Plain - includes the actual coastal area of the state and the Sea Islands, as well as the Okefenokee Swamp

The following map shows the general divisions of the 3 geographical regions:

in

Plain

217
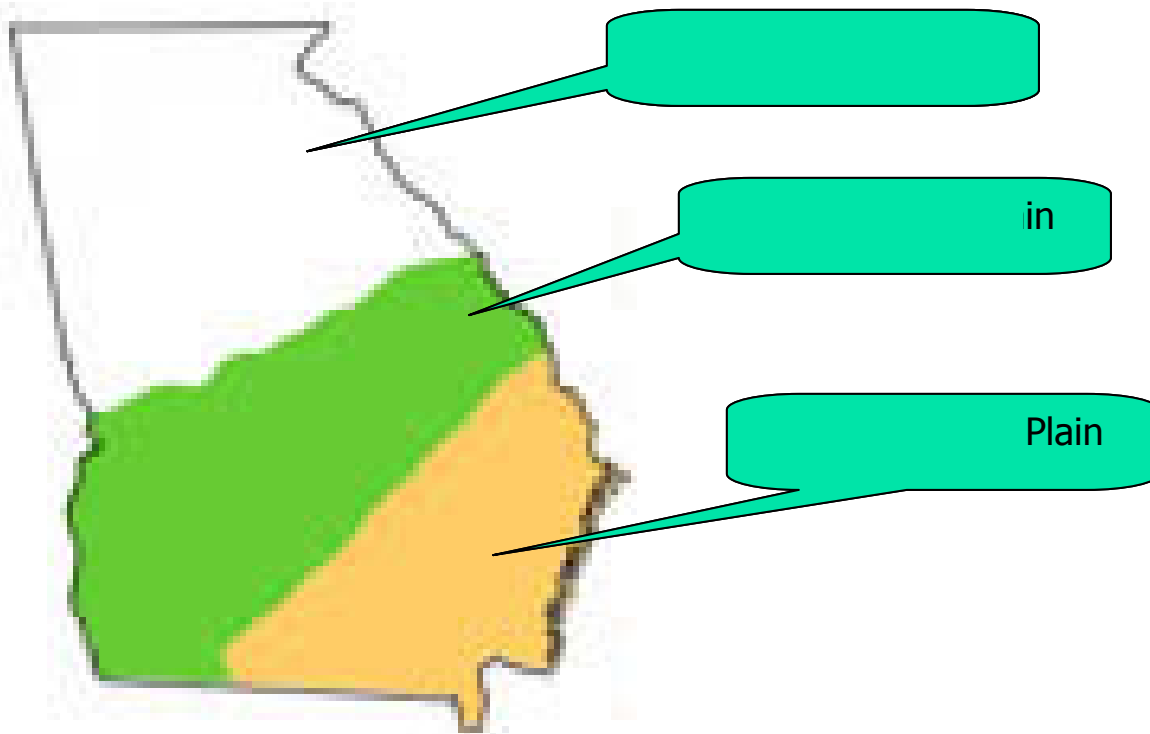
In addition to being able to correctly identify the geographical region, the appraiser must also be able to determine the species of pine tree that has been planted. The identification of the species of pine tree is critical so the proper yield table can be used in the timber value calculation.

In the Piedmont area, Loblolly pines are the only species found in the yield table. For the Upper Coastal Plain and the Lower Coastal Plain, yield tables for Loblolly pine and Slash pine are available.

Below are photographs of the two species of pines that an appraiser must select from:

h Pine

Tree Characteristics of Loblolly Pine:

- **Height at maturity:**
  Typical: 25 to 33 m (90 to 110 ft)
  Maximum: 49.7 m (163 ft)
- **Diameter at breast height at maturity:**
  Typical: 90 to 120 cm (36 to 48 in)
  Maximum: 140 cm (56 in)
- **Crown shape:** broadly conical; dense
- **Stem form:** excurrent; often slightly crooked or swept
- **Branching habit:** long and spreading; well developed limbs

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Loblolly Pine is the most important and widely cultivated timber species in the southern United States. Because it grows rapidly on a wide range of sites, it is extensively planted for lumber and pulpwood. This tree is dominant on 11.7 million hectares (29 million acres) and comprises over half of the standing pine volume in the south. A medium lived tree, loblolly matures in about 150 years, with select trees reaching 300 years in age. Sonderegger pine (*Pinus × sondereggeri* H.H. Chapm.) is a natural hybrid between loblolly pine and longleaf pine (*Pinus palustris* Mill.), and occurs throughout the southeast.

Timber Regulations

Tree Characteristics of Slash Pine:

Slash pine is a common associate of loblolly pine (*Pinus taeda*). The length and number of needles per fascicle, cones, and bark can be used to differentiate them. Slash pine has "brooms" of needles at the ends of rough twigs. Needles may be 5" to 11" long and are borne2 to 3 to a fascicle. Cones range from 5" to 8" in length. Loblolly has 3 needles per fascicle that are 6" to 10" long. Loblolly cones are 3" to 6" long, but they are light reddish-brown and persist for three years of growth. Also, loblolly cones are far pricklier than slash pine cones. Bark of slash pine has large, flat, orange-brown plates. Loblolly bark is thick and divides into irregular, dark brown scaly blocks.

Identifying Characteristics	
Size/Form:	Slash pine is a medium to large tree that reaches heights of 80' to 115' tall. It has crown characterized by a round top and "brooms" of needles at the ends of the branches.
Leaves:	The needles are borne in sheathed fascicles of two or three, spirally arranged, and persistent. The needles are 5" to 11" long.
Fruit:	The fruit is a woody cone that is 5" to 8" long. It is dark brown. At the tip of the scales is a small, out-curved spine.
Bark:	The orange-brown bark is scaly and has plates.
Habitat:	It grows in the infertile soils of sandhills, flatwoods, and near wet lowlands, such as swamps and ponds.

In addition to valuing pre-merchantable timber for value extraction, a value will need to be determined for stands of trees that have reached the age of merchantability (16 years and older). There are no "magic formulae" or definitive steps such as with pre-merchantable timber in determing the value of merchantable timber. The knowledge and expertise of an individival trained in collecting timber information should be utilized when merchantable timber is present. A cruise which is defined as an estimation of the volume and value of timber is a preferred means of obtaining the value of merchantable timber.

Merchantable timber can be assigned to one of the 3 major categories, pulpwood, chip-n-saw and sawtimber. Many natural stands will have a mix of all 3 categories. Planted stands of timber due to the fact that the trees were planted at the same time will be of one category but over time will evolve into the next higher merchantable category.

5. Pulpwood – Trees between 4 to 8 inches dbh (Diameter Breast Height – 4.5 ft above forest floor on uphill side of tree)

6. Chip and Saw – Trees between 9 to 12 inches dbh

7. Sawtimber – Tree with dbh above 12 inches

Timber Valuation – Example 1

Map ID 022-009 is a 600 acre tract of rural land which sells for $850,000. All indications are that the sell is qualified. However, upon inspection of the parcel, the appraiser notes that there is a considerable amount of timber present on the property. Efforts to contact the buyer and seller have produced no information with regard to timber values or volumes.

The county contracts with a registered forester who upon a visit to the property and the use of aerial photography concludes that the following timber volumes and acres are present. The forester, also, states that the stocking density of the pre-merchantable stands is average and the cost of establishing planted timber stands is about $130 per acre.

Merchantable Timber	
Timber Type	Tons
Pine Pulpwood	200
Pine Chip-n-Saw	1500
Pine Sawtimber	6300
Hardwood Sawtimber	550

Pre-Merchantable Timber		
Timber Type	Age	Acres
Pine	7	60.00
Pine	12	25.00

The appraiser must now determine the value of the timber that is to be deducted from the sales price. Use the Table of Owner Harvest Timber Values provided in the manual for Burke County.

Timber Valuation Worksheet - Merchantabile Timber				
Map ID: 022-009			Date: 06/30/05	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Volume (Tons)**	**Unit Price**	**Value**	
Softwood Pulpwood	200	6.13	1,226	
Softwood Chip-n-Saw	1500	21.70	32,550	
Softwood Sawtimber	6300	34.91	219,933	
Softwood Poles				
Softwood Posts				
Softwood Fuelchips				
Hardwood Pulpwood				
Hardwood Sawtimber	550	27.31	15,021	
Hardwood Firewood				
Total Merchantable Timber Value			268,730	
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID: 022-009			Date: 06/30/05	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood	(52.2 * .90) 47	6.13	1.00	288
Chip-n-Saw	(52.2 * .10) 5.0	21.70	1.00	109
Total Value/Acre (Pulpwood + Chip-n-Saw)				397
Acres of Pre-Merch				60.00
Total Value (Total Value/Acre x Acres)				23,820
Cost (Cost of Establishing Stand / Acre * Acres) (60 * 130)				7,800
Base Value (Total Value – Cost)				16,020
Age of Merch (15 is default; local conditions take precedance)				15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				1,068
Age of Stand (in years)				7
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				7,476
Total Accumulated Value (Accumulated Timber Growth + Cost)				15,276
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)					
Map ID: 022-009			Date: 06/30/05		
Buyer/Seller Value:					
Estimated Value Calculations					
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**		**Value**
Pulpwood	(52.2 * .90) 47	6.13	1.00		288
Chip-n-Saw	(52.2 * .10) 5.0	21.70	1.00		109
Total Value/Acre (Pulpwood + Chip-n-Saw)					397
Acres of Pre-Merch					25
Total Value (Total Value/Acre x Acres)					9,925
Cost (Cost of Establishing Stand / Acre * Acres) (25 * 130)					3,250
Base Value (Total Value – Cost)					6,675
Age of Merch (15 is default; local conditions take precedance)					15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)					445
Age of Stand (in years)					12
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)					5,340
Total Accumulated Value (Accumulated Timber Growth + Cost)					8,590
Information Supplied by:					

Timber Value Summary	
Map ID: 022-009	Date: 06/30/05
Timber Type	**Value**
Merchantable	268,730
Pine Pre-Merchantable (Planted)	23,866
Pine Pre-Merchantable (Natural)	
Hardwood Pre-Merchantable	
Total Value of all Timber Types	292,596

Timber Valuation – Example 2

Map ID 022-010 is a 200 acre tract of rural land which sells for $300,000. All indications are that the sell is qualified. Upon inspection of the parcel, the appraiser notes that the entire 200 acres is planted pine. Efforts to contact the buyer and seller have produced no information with regard to timber values or volumes but the seller did state that the age of the Loblolly planted pine stand is 5 years.

The county has soil maps and has determined the following with regard to productivity ratings and acreage. Information from a forester states that Burke County is in the Upper Coastal Plain region, the stocking density of the pre-merchantable Loblolly stand is average and the cost of establishing planted timber stands is about $130 per acre.

Productivity Rating	Acres
2	80
5	100
8	20

The appraiser must now determine the value of the timber that is to be deducted from the sales price. Use the Table of Owner Harvest Timber Values provided in the manual for Burke County and the land productivity rating-timber yield table provided in Rule 560-11-10-.09(3)(b)2(v)(I)II.

Productivity-Volume Worksheet					
Map ID: 022-010			**Acres:** 200.00	**Date:** 06/30/05	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW Vol**	**Wt CS Vol**
2	93	10	80 acs – 40%	37.20	4.00
5	70	8	100 acs – 50%	35.00	4.00
8	18	0	20 acs – 10%	1.80	0.00
			Total Volume	74.00	8.00

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID: 022-010			Date: 06/30/05	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood	74.00	6.13	1.00	454
Chip-n-Saw	8.00	21.70	1.00	174
Total Value/Acre (Pulpwood + Chip-n-Saw)				628
Acres of Pre-Merch				200.00
Total Value (Total Value/Acre x Acres)				125,600
Cost (Cost of Establishing Stand / Acre * Acres)				26,000
Base Value (Total Value – Cost)				99,600
Age of Merch (15 is default; local conditions take precedance)				15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				6,640
Age of Stand (in years)				5
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				33,200
Total Accumulated Value (Accumulated Timber Growth + Cost)				59,200
Information Supplied by:				

Timber Value Summary	
Map ID: 022-010	Date: 06/30/05
Timber Type	**Value**
Merchantable	
Pine Pre-Merchantable (Planted)	59,200
Pine Pre-Merchantable (Natural)	
Hardwood Pre-Merchantable	
Total Value of all Timber Types	59,200

Timber Valuation – Exercise 1

Map ID 030-012 is a 400 acre tract of rural land which sells for $765,000 in Burke County. All indications are that the sell is qualified. However, upon inspection of the parcel, the appraiser notes that there is a considerable amount of timber present on the property. Efforts to contact the buyer and seller have produced no information with regard to timber values or volumes.

The county contracts with a registered forester who upon a visit to the property and the use of aerial photography concludes that the following timber volumes and acres are present. The forester, also, states that the stocking density of the Loblolly pre-merchantable stands is 80% and the cost of establishing planted timber stands is about $110 per acre. Burke Co is located in the Upper Coastal Plain region of the State.

Merchantable Timber	
Timber Type	Tons
Pine Pulpwood	400
Pine Chip-n-Saw	2200
Pine Sawtimber	7600
Hardwood Sawtimber	1100

Pre-Merchantable Pine – 8 years old	
Productivity Rating	Acres
2	5
4	8
5	12

Pre-Merchantable Pine – 14 years old	
Productivity Rating	Acres
3	10
6	14

Calculate the value of timber to be extracted from the sales price.

Timber Valuation Worksheet - Merchantabile Timber				
Map ID:		Date:		
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Volume (Tons)**	**Unit Price**	**Value**	
Softwood Pulpwood				
Softwood Chip-n-Saw				
Softwood Sawtimber				
Softwood Poles				
Softwood Posts				
Softwood Fuelchips				
Hardwood Pulpwood				
Hardwood Sawtimber				
Hardwood Firewood				
Total Merchantable Timber Value				
Information Supplied by:				

231

Productivity-Volume Worksheet					
Map ID:			**Acres:**	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW Vol**	**Wt CS Vol**
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

Productivity-Volume Worksheet					
Map ID:			**Acres:**	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW Vol**	**Wt CS Vol**
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

233

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood				
Chip-n-Saw				
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Total Value (Total Value/Acre x Acres)				
Cost (Cost of Establishing Stand / Acre * Acres)				
Base Value (Total Value – Cost)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				
Total Accumulated Value (Accumulated Timber Growth + Cost)				
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood				
Chip-n-Saw				
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Total Value (Total Value/Acre x Acres)				
Cost (Cost of Establishing Stand / Acre * Acres)				
Base Value (Total Value – Cost)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				
Total Accumulated Value (Accumulated Timber Growth + Cost)				
Information Supplied by:				

Timber Value Summary	
Map ID:	Date:
Timber Type	**Value**
Merchantable	
Pine Pre-Merchantable (Planted)	
Pine Pre-Merchantable (Natural)	
Hardwood Pre-Merchantable	
Total Value of all Timber Types	

Timber Valuation – Exercise 2

Map ID 031-014 is a 200 acre tract of rural land which sells for $350,000 in Burke County. All indications are that the sell is qualified. However, upon inspection of the parcel, the appraiser notes that there is a considerable amount of timber present on the property. Efforts to contact the buyer and seller have produced no information with regard to timber values or volumes.

The county contracts with a registered forester who upon a visit to the property and the use of aerial photography concludes that the following timber volumes and acres are present. The forester, also, states that the stocking density of the Loblolly pre-merchantable stands is 100%. The cost of establishing planted timber stands is about $250 per acre. Burke Co is located in the Upper Coastal Plain region of the State.

Merchantable Timber	
Timber Type	Tons
Pine Pulpwood	250
Pine Chip-n-Saw	1800
Pine Sawtimber	1400
Hardwood Sawtimber	450

Loblolly Pre-Merchantable Pine – 12 years old	
Productivity Rating	Acres
1	3
5	15

Slash Pre-Merchantable Pine – 7 years old	
Productivity Rating	Acres
2	18
4	21

Natural Regeneration – Loblolly – 16 ft Height	
Productivity Rating	Acres
6	31

Based on a sampling of a one acre plot, it is determined that on the average 75 trees have died per acre. The planting pattern for these trees is 10' rows with 8' feet between the trees. Calculate the value of timber to be extracted from the sales price.

Timber Valuation Worksheet - Merchantabile Timber				
Map ID:		Date:		
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Volume (Tons)**	**Unit Price**	**Value**	
Softwood Pulpwood				
Softwood Chip-n-Saw				
Softwood Sawtimber				
Softwood Poles				
Softwood Posts				
Softwood Fuelchips				
Hardwood Pulpwood				
Hardwood Sawtimber				
Hardwood Firewood				
Total Merchantable Timber Value				
Information Supplied by:				

Productivity-Volume Worksheet					
Map ID:			**Acres:**	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW Vol**	**Wt CS Vol**
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

Productivity-Volume Worksheet					
Map ID:			**Acres:**	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW Vol**	**Wt CS Vol**
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

241

Productivity-Volume Worksheet					
Map ID:			**Acres:**	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW Vol**	**Wt CS Vol**
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

242

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood				
Chip-n-Saw				
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Total Value (Total Value/Acre x Acres)				
Cost (Cost of Establishing Stand / Acre * Acres)				
Base Value (Total Value – Cost)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				
Total Accumulated Value (Accumulated Timber Growth + Cost)				
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood				
Chip-n-Saw				
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Total Value (Total Value/Acre x Acres)				
Cost (Cost of Establishing Stand / Acre * Acres)				
Base Value (Total Value – Cost)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				
Total Accumulated Value (Accumulated Timber Growth + Cost)				
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Natural)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking Density**	**Value**
Pulpwood				
Chip-n-Saw				
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Total Value (Total Value/Acre x Acres)				
Cost (Cost of Establishing Stand / Acre * Acres)				
Base Value (Total Value – Cost)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Accumulated Timber Growth (Average Annual Timber Growth * Age of Stand)				
Total Accumulated Value (Accumulated Timber Growth + Cost)				
Information Supplied by:				

Timber Value Summary	
Map ID:	Date:
Timber Type	**Value**
Merchantable	
Pine Pre-Merchantable (Planted)	
Pine Pre-Merchantable (Natural)	
Hardwood Pre-Merchantable	
Total Value of all Timber Types	

246

Rural Land – Determination of Location/Size Factors for Large Parcels

The base land values that were calculated for large tracts were a result of analyzing the market for the typical ag tract and determining the use values for such properties. The values that were calculated should contain little or no adjustment for location and size. However, within any county there will be parcels with acreage above the small acre break point but less than the standard ag parcel acreage. Typically, these parcels require adjustments for location and size to generate the property's Fair Market Value.

The lack of size/location adjustments in a rural land schedule can result in the following situation where the small acre break point exists and the large tract land schedule is applied. The value of a 25.00 acre small parcel with an accessibility/desirability code of 3C is 25,000 (25 * 1,000/acre). The value of a 26 acre parcel that has 10 acres of Class II open land and 16 acres of Class W3 woodland is 11,800. The value difference of 13,200 dollars is difficult to explain to a taxpayer since the lower valued parcel is the larger of the two.

A more definitive means of determining the need for such adjustments would be through a sales-assessment ratio study. A ratio study performed on the 15 sales that were used to derive the large tract base land values would produce the following statistics:

- Median = .3951
- COD = .0205
- PRD = 1.0015

If the sales of the 10 smaller ag tracts on the following pages are introduced into the study, the statistics are as follows:

- Median = .3818
- COD = .1107
- PRD = .9397

The statistics above indicate that the rural land large tract schedule is producing the correct assessment level with acceptable uniformity but the schedule contains bias toward the smaller tracts which is known as progressivity. In other words, the larger parcels would have the higher ratios. If the sales were arrayed by size, it would be obvious as to this fact.

The progessivity of the rural land schedule, in this case, is due to the lack of a component of fair market value which is an adjustment/factor for size and location. The size/location adjustment

Timber Regulations

would fall under the category of "any other factors deemed pertinent in arriving at fair market value" as defined in Georgia Code Section 48-5-2.

The sales price of Sale #16 below is 27,000 with an accessibility assignment of 3. The appraised value of the land using the rural land base schedule is 22,900 as calculated below.

Classification	Acres	$/Acre	Value
II	25.00	700	17,500
W2	18.00	300	5,400
		Land "Use" Value	22,900

The value difference of 4,100 between the sales price and the Use Value can be attributed to size and location influences. In the business of mass appraisal, the value difference is best defined as a factor that can be easily applied to hundreds, perhaps thousands of parcels.

The size/location adjustment factor would be 1.1790 and would be calculated by dividing the residual land sales price by the land use value. The factor as stated in the APM must be taken to four (4) decimal places. The steps for the factor calculation are as follows:

- Residual Land Price = Sales Price – Non-Land Value
- Loc/Size Adj   = Res Land Price / App Use Value (round to 4 decimal positions)

Accessibility assignments should be based on the location of the parcel within the county and the accessibility areas defined in the small parcel market analysis. Factors for all sales should be calculated and placed in an accessibility/desirability table at the proper acre level and accessibility code point such as in the example below using Sale #16.

Acre/Acc	1	2	3	4	5
26.00					
27.00					
28.00					
(29 – 42)					
43.00			1.1790		

After all size/location adjustments are calculated, the appraiser should establish a benchmark point in the table and then using interpolation routines to calculate accessibility and acreage factors, extend the factors throught the accessibility/desirability table for tracts above the small acre break point.

Large Tract Transitional Table

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

Large Tract Acc/Des Table

Acres	1	2	3	4	5

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
26	1.8715	1.7405	1.6187	1.5054	1.4000
27	1.8341	1.7057	1.5863	1.4753	1.3720
28	1.7974	1.6716	1.5546	1.4458	1.3446
29	1.7615	1.6382	1.5235	1.4169	1.3177

251

Timber Regulations

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

30	1.7263	1.6054	1.4930	1.3886	1.2913
31	1.6918	1.5733	1.4631	1.3608	1.2655
32	1.6580	1.5418	1.4338	1.3336	1.2402
33	1.6248	1.5110	1.4051	1.3069	1.2154

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
34	1.5923	1.4808	1.3770	1.2808	1.1911
35	1.5605	1.4512	1.3495	1.2552	1.1673
36	1.5293	1.4222	1.3225	1.2301	1.1440
37	1.4987	1.3938	1.2961	1.2055	1.1211

Timber Regulations

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
38	1.4687	1.3659	1.2702	1.1814	1.0987
39	1.4393	1.3386	1.2448	1.1578	1.0767
40	1.4105	1.3118	1.2199	1.1346	1.0552
41	1.3823	1.2856	1.1955	1.1119	1.0341

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
42	1.3547	1.2599	1.1716	1.0897	1.0134
43	1.3276	1.2347	1.1482	1.0679	0.9931
44	1.3010	1.2100	1.1252	1.0465	0.9732
45	1.2750	1.1858	1.1027	1.0256	0.9537

Timber Regulations

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

	1	2	3	4	5
46	1.2495	1.1621	1.0806	1.0051	0.9346
47	1.2245	1.1389	1.0590	0.9850	0.9159
48	1.2000	1.1161	1.0378	0.9653	0.8976
49	1.1760	1.0938	1.0170	0.9460	0.8796

Acres	1	2	3	4	5
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
50	1.1525	1.0719	0.9967	0.9271	0.8620

Timber Regulations

Using Absorption Methodology in Rural Land Schedules

In most counties, parcels of rural land exist that are larger than the typical size agricultural tract that sales. These "super sized" parcels may range from 400 to 500 acres and up to thousands of acres depending upon the county. Typically, there are few to no sales of these type tracts. Consequently, the appraiser is left without any real guidelines as to how to generate size adjustments to these parcels.

In the absence of adequate sales to develop size adjustments for the "super sized" parcels, the APM provides the appraiser with a means of arriving at size adjustments through absorption methodology. The appraiser should remember that this methodology is used only when adequate sales of rural large tracts are not available to provide market indications of size factors.

In Rule 560-11-10-.02(1)(a), an absorption rate is defined as the rate at which the real estate market can absorb real property of a given type. In this situation, the appraiser is concerned with the rate at which a large tract of land can be absorbed by the market if it is divided into smaller marketable units and then determining the present worth of the property by discounting the future worth of the parcel to present-day dollars.

Rule 560-11-10-.09(3)(b)(2)(iv) provides the methodology by which the appraise shall determine the rate of absorption and apply the rate to the valuation process. The Rule states

"When insufficient large tract sales are available to create a reliable schedule of factors, the appraisal staff may use comparable sales to develop values for the size tracts for which comparables exist, and then adjust these values for larger tracts by (1) estimating a rate of absorption for the smaller tracts for which data exists, (2) dividing the large tract into smaller, marketable sections, (3) developing a sales schedule with estimated income by year reflecting the absorption rate and the value characteristics of each of the smaller tracts, (4) discounting the income schedule to the present using an appropriate discount rate, and (5) summing the resulting values to arrive at an estimated value for the property. "

Each step of developing an absorption rate as outlined in the Rule above will be discussed on the following pages.

The **initial step** in the process is to estimate a rate of absorption for the smaller tracts for which data exits and to define a standard size for ag tracts. This can be translated as determing the number of smaller marketable units that are generally sold each year and the average size of the tracts. The number of smaller marketable units may be obtained in the following manner:

1. The "true" ag tracts should be arrayed by acreage.

2. From the array of ag tracts the appraiser should select an acreage level where the largest number of sales have occurred. Due to the limited number of sales, the acreage level may actually be an acreage range, not a specific number of acres. For example, the appraiser

may select a range of 150 to 250 acres with an average acreage level of 200 acres. The average acreage level will be termed the standard ag marketable tract. In some situations, a period of time extending beyond 1 year may need to be used to provide the appraiser with a clear indication of the standard size for ag tracts.

3. The rate of absorption will be the number of sales that occur at the acre level or within the acreage range. If more than one year is used to draw the conclusion, the appraiser should average the number of sales over the number of years to produce a yearly rate.

The **second step** of the process is dividing the large tract into smaller, marketable units. In the fee appraisal process, each parcel to be appraise that is larger than the standard marketable unit would need to be analyzed. However, considering the volume of parcels that must be appraised each year in mass appraisal, the appraiser must take a different approach. Consequently, the large tract will be identified as the largest non-exempt, non-utility parcel in the county. The large tract should then be divided into smaller marketable units by dividing the acreage in the large tract by the total acres of the standard ag marketable tracts which produces the number of marketable sections.

For example, if the largest parcel in the county is 5,000 acres and the standard ag marketable tract is 200 acres with 5 such standard ag parcels sold each year, the appraiser would determine the total acres of the standard ag marketable tract by multiplying the standard ag marketable acreage by the number for standard ag parcels sold. (200 * 5 = 1000).

The total standard ag acres would then be divided into the acreage of the large tract to generate the number of years expected to sell off the large tract (5000 ÷ 1000 = 5). This will be known as the sell-off period.

The **third step** in the absorption process is to develop a sales schedule with estimated income by year reflecting the absorption rate and the value characteristics of each of the smaller tracts. In other words, the appraiser should determine the value of the smaller marketable ag units. Since the result of the absorption process will be applied to all large tracts across the county, the appraise may determine the composition of the standard ag tract in the county and apply that to the county's base rural land schedule to generate the value of the smaller marketable ag units.

259

For example, if the standard ag tract size is 200 acres, the value of the standard ag tract may be calculated in the following manner

Std Land Use/Class	Percentage	Std Ag Use Acres (Std Ag Acres * Percentage)	Per Acre Value	Use/Class Value
A3	5	(200 * .05) = 10	1750	17,500
A5	15	(200 * .15) = 30	1050	31,500
W4	45	(200 * .45) = 90	1350	121,500
W7	35	(200 * .35) = 70	1050	73,500
Total Value				244,000

With the number of marketable units being 5, the total value of the marketable section would be the value of std ag tract times the number of mkt units or 244,000 * 5 = 1,220,000.

Step four of the absorption process involves discounting the income schedule to the present using an appropriate discount rate. This can be translated as determining the present worth of the standard ag marketable units for each year with a discount rate. The discount rate can be defined as the rate of return that most buyers would expect from an investment in rural land. In the absence of that information, the appraiser may inquire of local lending institutions as to the typical rate for borrowing funds to purchase rural land properties.

In our example, the sell-off period is 5 years as calculated in Step 2 and the value of the standard marketable acreage as determined in Step 3 is 1,260,000. The discount rate is 7%. The value of the standard marketable acreage must be discounted for each year of the sell-off period.

The present value of a future income stream can be calculated with the following formula:

$$PV = FV \div (1 + i)^n$$

Where PV = present value, FV = future value, i = discount rate, and n = the year of the income stream for which the present value is sought. For example, if we were looking for the present

value of the standard marketable acreage in the fourth year of the sell-off period, the present value formula would be applied in the manner below:

$PV = 1,220,000 \div (1 + .07)^4$
$PV = 1,220,000 \div 1.07^4$
$PV = 1,220,000 \div 1.3108$
$PV = 930,729$

Following is a table containing the present value for each year of the sell-off period of a standard 5,000 acre tract.

Year	Value	Rate	Present Value
0	1,220,000	7.00	1,220,000
1	1,220,000	7.00	1,140,187
2	1,220,000	7.00	1,065,595
3	1,220,000	7.00	995,883
4	1,220,000	7.00	930,729

Timber Regulations

The **fifth step** in the absorption process is summing the resulting values to arrive at an estimated value for the property. This can be stated as totaling the present value for each year to produce the total discounted value of the large tract.

The table below contains the sum of the present values for the 5,000 acre tract.

Year	Value	Rate	Present Value
0	1,220,000	7.00	1,220,000
1	1,220,000	7.00	1,140,187
2	1,220,000	7.00	1,065,595
3	1,220,000	7.00	995,883
4	1,220,000	7.00	930,729
		Total Value	5,352,394

The process above could be applied to all large tracts of rural land. However, that would require the appraiser to be more specific as to the composition of the subject properties and the calculations would have to be done hundreds of times.

With the use of composition and value standards for the county, a **sixth step** can be added to the process whereby the information derived from this process can be used to create a size factor for the large tract which through interpolation can be applied to all parcels that are categorized as rural land and have acreage above the standard ag tract size. The size factor should be integrated into the county's accessibility/desirability table.

The size adjustment is calculated by dividing the discounted per acre value of the large tract by the per acre value of the standard ag marketable tract. The steps to perform this calculation are as follows:

- Value of std mkt tract of 200 acres = 244,000
- Value of 5,000 acre tract = 5,392,394
- Size Adj = $ per ac of large tract / $ per ac of std tract
- Size Adj = 1,078 / 1,220
- Size Adj = .8836

The size factor would be added to the accessibility/desirability table as in the example below:

Acres	Factor
50.00	1.4335
100.00	1.0554
200.00	1.0000
5000.00	.8836

Using an interpolation routine such as the one below, size factors could be determined for all acreage levels. The formula for the interpolation of size factors is

$$(((A - L) / (U - L)) * (UV - LV)) + LV$$

- A = acre level where size factor is needed
- L = lower acre level in schedule within acre range of A
- U = upper acre level in schedule within acre range of A
- LV = Factor at L acre level
- UV = Factor at U acre level

If the size factor for a 1500 acre tract is needed, the calculations would take place as follows:

- $(((A - L) / (U - L)) * (UV - LV)) + LV$
- $(((1500 - 200) / (5000 - 200)) * (.8836 - 1.0000)) + 1.0000$
- $((1300 / 4800) * -.1164) + 1.0000$
- $(.2708 * -.1164) + 1.0000$
- $-.0315 + 1.0000 = .9685$

The size factors would be applied to the "use" values of the ag parcels to generate the Fair Market Value of the land. The "use" values are calculated by applying the base land schedule to the acreage associated with each use/productivity rating classification within the parcel.

In the example above, the size factor was calculated for the entire county without regard to accessibility areas. Considering the size of the large tracts, the appraiser may find this to be acceptable. However, if sales indicate a need to calculate a different size factor for each accessibility area, the appraiser may do so keeping in mind that the value of the standard marketable ag acreage must be adjusted for location.

263

Absorption Exercise

Develop a size factor for large ag tracts within a county where the following determinations were made:

- 5 parcels sold each year within an acre range of 100 to 200 acres
- Average compostion of rural land tracts is W3-10%, W5-40%, W8-15%, A2-5%, A5-20%, A7-10%
- Schedule values are as follows
    - W3 – 1200
    - W5 -   900
    - W8 –   500
    - A2 – 2000
    - A5 - 1400
    - A7 -   900
- 2500 acres is largest ag parcel
- 8 % is expected rate of return

Fair Market Value Exercise

Calculate the value of a 800 acre ag tract which is 80% open and 20% wooded. The value of the open land is 2000 per acre; the woodland value is 1500 per acre. The accessibility/desirability table that is to be used is as follows:

Acres	Factor
50.00	1.4335
100.00	1.0554
150.00	1.0000
2500.00	.8351

Appendix

County Listing

County #	County
001	APPLING
002	ATKINSON
003	BACON
004	BAKER
005	BALDWIN
006	BANKS
007	BARROW
008	BARTOW
009	BEN HILL
010	BERRIEN
011	BIBB
012	BLECKLEY
013	BRANTLEY
014	BROOKS
015	BRYAN
016	BULLOCH
017	BURKE
018	BUTTS
019	CALHOUN
020	CAMDEN
021	CANDLER
022	CARROLL
023	CATOOSA
024	CHARLTON
025	CHATHAM
026	CHATTAHOOCHEE
027	CHATTOOGA
028	CHEROKEE
029	CLARKE
030	CLAY
031	CLAYTON
032	CLINCH
033	COBB
034	COFFEE
035	COLQUITT
036	COLUMBIA
037	COOK
038	COWETA
039	CRAWFORD
040	CRISP
041	DADE

County #	County
042	DAWSON
043	DECATUR
044	DEKALB
045	DODGE
046	DOOLY
047	DOUGHERTY
048	DOUGLAS
049	EARLY
050	ECHOLS
051	EFFINGHAM
052	ELBERT
053	EMANUEL
054	EVANS
055	FANNIN
056	FAYETTE
057	FLOYD
058	FORSYTH
059	FRANKLIN
060	FULTON
061	GILMER
062	GLASCOCK
063	GLYNN
064	GORDON
065	GRADY
066	GREENE
067	GWINNETT
068	HABERSHAM
069	HALL
070	HANCOCK
071	HARALSON
072	HARRIS
073	HART
074	HEARD
075	HENRY
076	HOUSTON
077	IRWIN
078	JACKSON
079	JASPER
080	JEFF DAVIS
081	JEFFERSON
082	JENKINS
083	JOHNSON
084	JONES
085	LAMAR
086	LANIER
087	LAURENS

267

County #	County
088	LEE
089	LIBERTY
090	LINCOLN
091	LONG
092	LOWNDES
093	LUMPKIN
094	MACON
095	MADISON
096	MARION
097	MCDUFFIE
098	MCINTOSH
099	MERIWETHER
100	MILLER
101	MITCHELL
102	MONROE
103	MONTGOMERY
104	MORGAN
105	MURRAY
106	MUSCOGEE
107	NEWTON
108	OCONEE
109	OGLETHORPE
110	PAULDING
111	PEACH
112	PICKENS
113	PIERCE
114	PIKE
115	POLK
116	PULASKI
117	PUTNAM
118	QUITMAN
119	RABUN
120	RANDOLPH
121	RICHMOND
122	ROCKDALE
123	SCHLEY
124	SCREVEN
125	SEMINOLE
126	SPALDING
127	STEPHENS
128	STEWART
129	SUMTER
130	TALBOT
131	TALIAFERRO
132	TATTNALL
133	TAYLOR

County #	County
134	TELFAIR
135	TERRELL
136	THOMAS
137	TIFT
138	TOOMBS
139	TOWNS
140	TREUTLEN
141	TROUP
142	TURNER
143	TWIGGS
144	UNION
145	UPSON
146	WALKER
147	WALTON
148	WARE
149	WARREN
150	WASHINGTON
151	WAYNE
152	WEBSTER
153	WHEELER
154	WHITE
155	WHITFIELD
156	WILCOX
157	WILKES
158	WILKINSON
159	WORTH

Timber Valuation Worksheets

Timber Valuation Worksheet - Merchantabile Timber				
Map ID:		Date:		
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Volume (Tons)**	**Unit Price**	**Value**	
Softwood Pulpwood				
Softwood Chip-n-Saw				
Softwood Sawtimber				
Softwood Poles				
Softwood Posts				
Softwood Fuelchips				
Hardwood Pulpwood				
Hardwood Sawtimber				
Hardwood Firewood				
Total Merchantable Timber Value				
Information Supplied by:				

Productivity-Volume Worksheet					
Map ID:			**Acres:**	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW**	**Wt CS Vol**
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

Productivity-Volume Worksheet					
Map ID:			**Acres:**	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW**	**Wt CS Vol**
1					
2					
3					
4					
5					
6					
7					
8					
9					
			Total Volume		

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood				
Chip-n-Saw				
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Total Value (Total Value/Acre x Acres)				
Cost (Cost of Establishing Stand / Acre * Acres)				
Base Value (Total Value – Cost)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Accumulated Timber Growth (Average Annual Timber Growth * Age of				
Total Accumulated Value (Accumulated Timber Growth + Cost)				
Information Supplied by:				

Timber Valuation Worksheet - Pine Pre-Merchantable (Natural)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood			.50	
Chip-n-Saw			.50	
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Base Value (Total Value/Acre x Acres)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Value of Accumulated Growth (Avg Annual Timber Growth * Age of Stand)				
Information Supplied by:				

Timber Valuation Worksheet - Hardwood Pre-Merchantable (Natural)				
Map ID:			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood			.50	
Chip-n-Saw			.50	
Total Value/Acre (Pulpwood + Chip-n-Saw)				
Acres of Pre-Merch				
Base Value (Total Value/Acre x Acres)				
Age of Merch (15 is default; local conditions take precedance)				
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				
Age of Stand (in years)				
Value of Accumulated Growth (Avg Annual Growth * Age of Stand *.40)				
Information Supplied by:				

Timber Value Summary	
Map ID:	Date:
Timber Type	**Value**
Merchantable	
Pine Pre-Merchantable (Planted)	
Pine Pre-Merchantable (Natural)	
Hardwood Pre-Merchantable	
Total Value of all Timber Types	

Timber Valuation- Exercise 1

<table>
<tr><td colspan="5" align="center">Timber Valuation Worksheet - Merchantabile Timber</td></tr>
<tr><td>Map ID: 030-012</td><td></td><td colspan="3">Date: 07/25/05</td></tr>
<tr><td colspan="5">Buyer/Seller Value:</td></tr>
<tr><td colspan="5" align="center">Estimated Value Calculations</td></tr>
<tr><td>Product Class</td><td>Volume (Tons)</td><td>Unit Price</td><td>Value</td><td></td></tr>
<tr><td>Softwood Pulpwood</td><td>400</td><td>6.13</td><td>2,452</td><td></td></tr>
<tr><td>Softwood Chip-n-Saw</td><td>2200</td><td>21.70</td><td>47,740</td><td></td></tr>
<tr><td>Softwood Sawtimber</td><td>7600</td><td>34.91</td><td>265,316</td><td></td></tr>
<tr><td>Softwood Poles</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Softwood Posts</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Softwood Fuelchips</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Hardwood Pulpwood</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Hardwood Sawtimber</td><td>1100</td><td>27.31</td><td>30,041</td><td></td></tr>
<tr><td>Hardwood Firewood</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="3" align="center">Total Merchantable Timber Value</td><td>345,549</td><td></td></tr>
<tr><td colspan="5">Information Supplied by:</td></tr>
</table>

Timber Regulations

Timber Valuation – Exercise 1

Productivity-Volume Worksheet					
Map ID: 030-012 (8 yr old stand)			**Acres:** 25.00	**Date:** 07/25/05	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW**	**Wt CS Vol**
1					
2	93	10	20	18.60	2.00
3					
4	77	8	32	24.64	2.56
5	70	8	48	33.60	3.84
6					
7					
8					
9					
			Total Volume	76.84	8.40

Productivity-Volume Worksheet					
Map ID: 030-012 (14 yr old stand)			**Acres:** 24.00	**Date:** 07/25/05	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW**	**Wt CS Vol**
1					
2					
3	84	9	10.00 acs - 42	35.28	3.78
4					
5					
6	63	4	14.00 acs – 58	36.54	2.32
7					
8					
9					
			Total Volume	71.82	6.10

Timber Valuation – Exercise 1

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID: 030-012 (8 yr old stand)			Date: 07/25/05	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood	76.84	6.13	.80	377
Chip-n-Saw	8.40	21.70	.80	146
Total Value/Acre (Pulpwood + Chip-n-Saw)				523
Acres of Pre-Merch				25.00
Total Value (Total Value/Acre x Acres)				13,075
Cost (Cost of Establishing Stand / Acre * Acres)				2,750
Base Value (Total Value – Cost)				10,325
Age of Merch (15 is default; local conditions take precedance)				15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				688
Age of Stand (in years)				8
Accumulated Timber Growth (Average Annual Timber Growth * Age of				5,504
Total Accumulated Value (Accumulated Timber Growth + Cost)				8,254
Information Supplied by:				

Georgia Department of Revenue

Timber Valuation – Exercise 1

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID: 030-012 (14 yr old stand)			Date: 07/25/05	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood	71.82	6.13	.80	352
Chip-n-Saw	6.10	21.70	.80	106
Total Value/Acre (Pulpwood + Chip-n-Saw)				458
Acres of Pre-Merch				24.00
Total Value (Total Value/Acre x Acres)				10,992
Cost (Cost of Establishing Stand / Acre * Acres)				2,640
Base Value (Total Value – Cost)				8,352
Age of Merch (15 is default; local conditions take precedance)				15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				557
Age of Stand (in years)				14
Accumulated Timber Growth (Average Annual Timber Growth * Age of				7,798
Total Accumulated Value (Accumulated Timber Growth + Cost)				10,438
Information Supplied by:				

Timber Regulations

Timber Valuation – Exercise 1

Timber Value Summary	
Map ID: 030-012	Date: 07/25/05
Timber Type	**Value**
Merchantable	345,549
Pine Pre-Merchantable (Planted)	10,438 + 8,254 = 18,692
Pine Pre-Merchantable (Natural)	
Hardwood Pre-Merchantable	
Total Value of all Timber Types	364,241

Timber Valuation - Exercise 2

Timber Valuation Worksheet - Merchantabile Timber				
Map ID: 031-014			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Volume (Tons)**	**Unit Price**	**Value**	
Softwood Pulpwood	250	6.13	1,533	
Softwood Chip-n-Saw	1800	21.70	39,060	
Softwood Sawtimber	1400	34.91	48,874	
Softwood Poles				
Softwood Posts				
Softwood Fuelchips				
Hardwood Pulpwood				
Hardwood Sawtimber	450	27.31	12,290	
Hardwood Firewood				
Total Merchantable Timber Value			101,757	
Information Supplied by:				

Timber Valuation - Exercise 2

Productivity-Volume Worksheet					
Map ID: 031-014			**Acres:** 18.00	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW**	**Wt CS Vol**
1	116	13	17	19.72	2.21
2					
3					
4					
5	70	8	83	58.10	6.64
6					
7					
8					
9					
			Total Volume	77.82	8.85

Timber Valuation - Exercise 2

Productivity-Volume Worksheet					
Map ID: 031-014			**Acres:** 39.00	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW**	**Wt CS Vol**
1					
2	102	11	46	46.92	5.06
3					
4	78	9	54	42.12	4.86
5					
6					
7					
8					
9					
			Total Volume	89.04	9.92

Timber Valuation - Exercise 2

Productivity-Volume Worksheet					
Map ID: 031-014			**Acres:** 31.00	**Date:**	
	Volume – Tons/Acre				
Productivity	**Pulpwood**	**Chip-n-Saw**	**% of Stand Ac**	**Wt PW**	**Wt CS Vol**
1					
2					
3					
4					
5					
6	63	4	100	63	4
7					
8					
9					
			Total Volume	63	4

Timber Valuation - Exercise 2

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID: 031-014			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood	77.82	6.13	.85	405
Chip-n-Saw	8.85	21.70	.85	163
Total Value/Acre (Pulpwood + Chip-n-Saw)				568
Acres of Pre-Merch				18
Total Value (Total Value/Acre x Acres)				10,224
Cost (Cost of Establishing Stand / Acre * Acres) (250 x 18)				4,500
Base Value (Total Value – Cost)				5,724
Age of Merch (15 is default; local conditions take precedance)				15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				382
Age of Stand (in years)				12
Accum Timber Growth (Average Annual Timber Growth * Age of Stand)				4,584
Total Accumulated Value (Accumulated Timber Growth + Cost)				9,084
Information Supplied by:				

Timber Valuation - Exercise 2

Timber Valuation Worksheet - Pine Pre-Merchantable (Planted)				
Map ID: 031-014			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood	89.04	6.13	.85	464
Chip-n-Saw	9.92	21.7	.85	183
Total Value/Acre (Pulpwood + Chip-n-Saw)				647
Acres of Pre-Merch				39
Total Value (Total Value/Acre x Acres)				25,233
Cost (Cost of Establishing Stand / Acre * Acres) (250 x 39)				9,750
Base Value (Total Value – Cost)				15,483
Age of Merch (15 is default; local conditions take precedance)				15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				1,032
Age of Stand (in years)				7
Accum Timber Growth (Average Annual Timber Growth * Age of Stand)				7,224
Total Accumulated Value (Accumulated Timber Growth + Cost)				16,974
Information Supplied by:				

Timber Valuation - Exercise 2

Timber Valuation Worksheet - Pine Pre-Merchantable (Natural)				
Map ID: 031-014			Date:	
Buyer/Seller Value:				
Estimated Value Calculations				
Product Class	**Vol(Tons)/Acre**	**Unit Price**	**Stocking**	**Value**
Pulpwood	63	6.13	.50	193
Chip-n-Saw	4	21.70	.50	43
Total Value/Acre (Pulpwood + Chip-n-Saw)				236
Acres of Pre-Merch				31
Total Value (Total Value/Acre x Acres)				7316
Cost (Cost of Establishing Stand / Acre * Acres)				0
Base Value (Total Value – Cost)				7316
Age of Merch (15 is default; local conditions take precedance)				15
Average Annual Timber Growth (Base Value ÷ Age of Merchantability)				488
Age of Stand (in years) (16' / 2' per yr)				8
Accumulated Timber Growth (Average Annual Timber Growth * Age of				3904
Total Accumulated Value (Accumulated Timber Growth + Cost)				3904
Information Supplied by:				

Timber Valuation - Exercise 2

Timber Value Summary	
Map ID:	Date:
Timber Type	**Value**
Merchantable	101,757
Pine Pre-Merchantable (Planted)	(9,084 + 16,974) = 26,058
Pine Pre-Merchantable (Natural)	3904
Hardwood Pre-Merchantable	
Total Value of all Timber Types	131,719

Fair Market Value Exercise

- Open Land = 800 * .80 = 640 acres
- Woodland = 800 * .20 = 160 acres
- Open Land Value = 640 * 2000 = 1,280,000
- Woodland Value = 160 * 1500 = 240,000
- Total Use Value = 1,520,000
- Size Adjustment:
- $(((A - L) / (U - L)) * (UV - LV)) + LV$
- $(((800 - 150) / (2500 - 150) * (.8347 - 1.0000)) + 1.0000$
- $((650 / 2350) * -.1653) + 1.0000$
- $(.2766 * -.1653) + 1.0000$
- -.0457 + 1.0000
- .9543
- FMV = 1,520,000 * .9543 = 1,450,536